

Historic, Archive Document

Do not assume content reflects current
scientific knowledge, policies, or practices.

25D11
.A3
cop. 3

Vegetation Map of the Kau Forest Reserve and adjacent lands, Island of Hawaii

James D. Jacobi



PACIFIC SOUTHWEST
FOREST AND RANGE
EXPERIMENT STATION
FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

RESOURCE BULLETIN PSW-16

The Author

JAMES D. JACOBI has been active in field research in the Hawaiian forests since 1971, working initially with the Island Ecosystems subprogram of the International Biological Program. At the time of the survey represented by this map, he was a graduate student at the University of Hawaii, working additionally as a botanist with the Fish and Wildlife Service, U.S. Department of Interior. He earned a bachelor's degree in biology (1970) at the University of California, Riverside.

ACKNOWLEDGMENT

● I thank the following members of the Fish and Wildlife Service, U.S. Department of Interior, Kau Forest Survey Team for assistance in the design and preparation of the map: J. Michael Scott, Tonnie L. C. Casey, and Charles van Riper III, who helped to identify the final map units, assisted in field-checking, and in the early drafts of the map; John Sincok, Mark Collins, Patrick Conant, and Robert Eddinger, who also took part in field-checking.

● I also thank Dieter Mueller-Dombois, University of Hawaii, and A. Stana Federighi, Fish and Wildlife Service, for their comments on the map and the manuscript; and Zoe Jacobi for help during preparation of the final draft of the map.

● Finally, I thank the managers of Kahuku Ranch, Kau Sugar Co., and Sea Mountain Ranch for allowing access to portions of the area surveyed, and Joe Haddin, who made possible many long but enjoyable hours of flying to check the map from the air.

FOREWORD

The map presented here is one result of an inventory of bird populations in the Kau Forest Reserve and adjacent lands, on the island of Hawaii, conducted by the Fish and Wildlife Service, U.S. Department of Interior, during summer 1976. The study attempted to determine the distribution and abundance of endangered native birds in the Kau and Kapapala Forest Reserves, and to relate their distribution to the major vegetation types found in this area.

The survey was a cooperative effort; funds and personnel were provided by the Fish and Wildlife Service and the Hawaii Division of Fish and Game. Funds were also provided by the Forest Service, U.S. Department of Agriculture, for data processing and publication of the vegetation type map.

Additional information resulting from the study will be reported in future publications, including more detailed descriptions of the vegetation and bird populations of this area and their interrelationships.

This map is one result of a survey of bird populations in the Kau Forest Reserve and adjacent lands on the island of Hawaii during summer 1976. The survey was conducted by the Fish and Wildlife Service, U.S. Department of Interior, in cooperation with the Hawaii Division of Fish and Game, and the Forest Service, U.S. Department of Agriculture. The area described, covering approximately 34,000 ha (83,980 acres), is on the southeastern flank of Mauna Loa volcano, between the elevations of 640 and 2225 m (2100 and 7300 ft), (fig. 1).

Ten U.S. Geological Survey quadrangle maps, 7.5-minute series, were used as a topographic base during the preparation of this map, (fig. 2) as shown below. The boundaries of the vegetation units were mapped using a mirror stereoscope, on 65 aerial photographs taken in 1965 (U.S. Dep. Agric., Agric. Stab. Conserv. Serv., EKL series). The mapped units were then extensively verified in the field, both on the ground and from the air. After field-checking and subsequent correction, the map unit boundaries on the air photos were optically transferred to an overlay on the topographic base map at the scale of 1:24,000. The map was then reduced to the scale of 1:48,000.

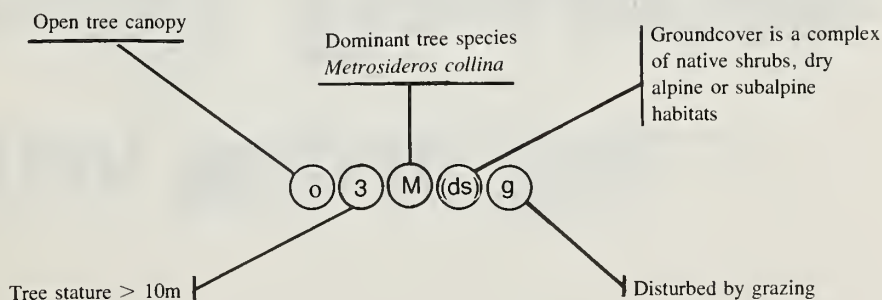
On the type map, vegetation is viewed at two levels of resolution. At the first level, nine general vegetation

types are identified, as shown in the color key. These types represent the physiognomy or external appearance of the vegetation, and the floristic or life-form composition of the dominant vegetation layer. Areas dominated by the tree layer (trees more than 5 m tall) are considered forest communities; those dominated by plants in the lower vegetation strata (herbs, shrubs, and tree fern less than 5 m tall) as tree fern, scrub, or grassland communities. The criterion for tree layer dominance is a canopy cover greater than 15 percent.

At the second level of resolution, the nine general vegetation types are further subdivided into 48 map units, on the basis of (1) tree canopy crown cover, (2) tree stature, (3) dominant species in the tree layer, and (4) ground cover type, which describes the species composition of the lower vegetation layers.

The vegetation type symbols are printed at least once within each unit polygon. They are made up of different combinations of characters describing the four basic attributes of the vegetation. In some symbols, a fifth component gives additional information about the community. For communities in which trees were found to be entirely absent, the first three components of the vegetation type symbol, referring to trees, are omitted. A key to the symbols and their interpretation appears below.

KEY TO SYMBOLS

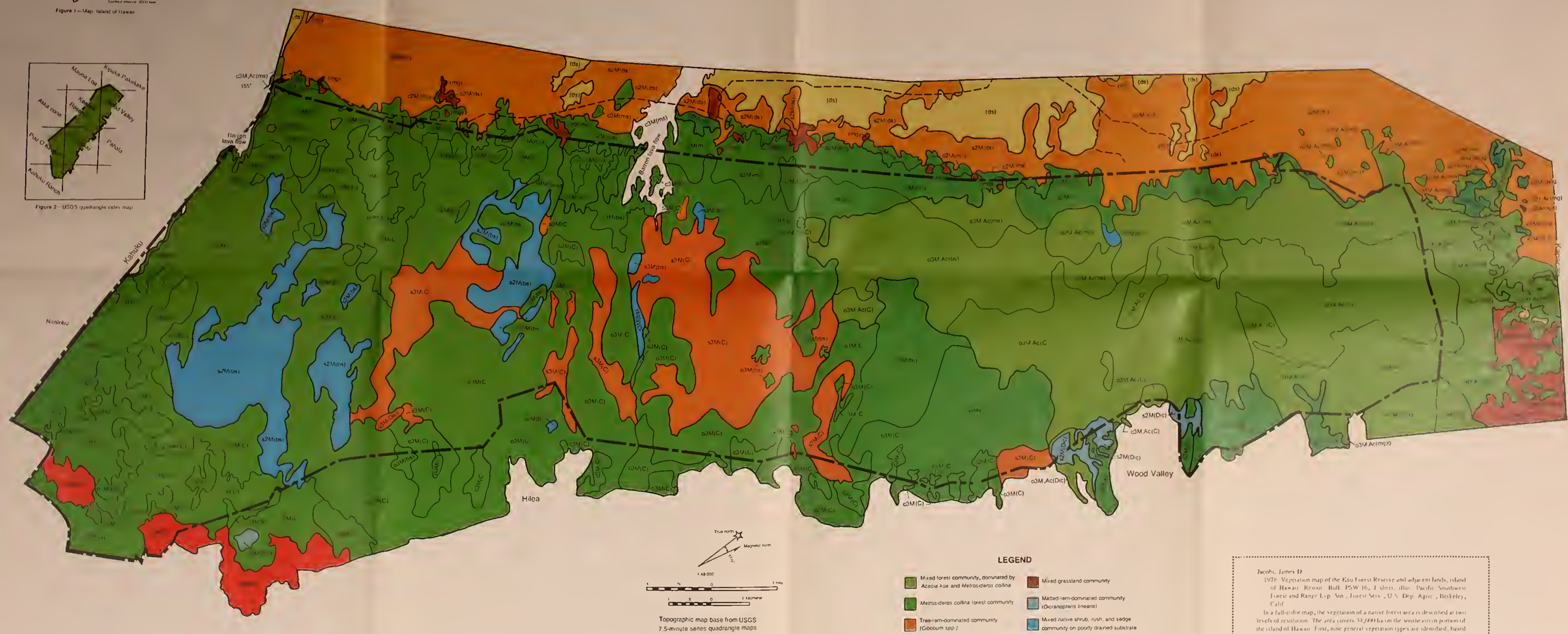






Vegetation Map of the Kau Forest Reserve and adjacent lands, Island of Hawaii

James D. Jacobi



- LEGEND**
- Mixed forest community, dominated by *Acacia koa* and *Metrosideros collina*
 - Metrosideros collina* forest community
 - Tree-fern-dominated community (*Gleichenia* spp.)
 - Subalpine native scrub community
 - Treeless alpine native scrub community
 - Mixed grassland community
 - Matted-fern-dominated community (*Dicranopteris linearis*)
 - Mixed native shrub, rush, and sedge community on poorly drained substrate
 - Introduced-shrub-dominated community
- Forest reservation boundary
--- Jeep road

Jacobi, James D.
1978. Vegetation map of the Kau Forest Reserve and adjacent lands, island of Hawaii. Resour. Bull. PSW-16, 1 sheet, illus. Pacific Southwest Forest and Range Exp. Sta., Forest Serv., U.S. Dep. Agric., Berkeley, Calif.

In a full-color map, the vegetation of a native forest area is described at two levels of resolution. The area covers 14,000 ha on the southeastern portion of the island of Hawaii. First, nine general vegetation types are identified, based on vegetation physiognomy and the floristic or life form composition of the dominant vegetation layer. Second, 48 vegetation types are distinguished, based on four components of the vegetation: tree canopy crown cover, tree stature, dominant species in the tree layer, and ground cover type.

Revised terms: bird populations, endangered species, population distribution, Hawaii, vegetation types, maps, Kau Forest Reserve, Kapapala Forest Reserve.

Pacific Southwest Forest and Range Experiment Station
P.O. Box 245
Berkeley, California 94701

December 1978

Tree Canopy Crown Cover

- c Closed canopy. Crown cover > 60%, with interlocking crowns.
- o Open canopy. Crown cover > 15-60%.
- s Scattered trees, no distinct canopy. Crown cover < 15%

Tree Stature

- 1 Trees > 2-5 m tall. (Not distinguished on map.)
- 2 Trees > 5-10 m tall.
- 3 Trees > 10 m tall.

Dominant Tree Species¹

- Ac *Acacia koa*
- M *Metrosideros collina*

Ground Cover

- (bs) Complex of native shrubs, rushes, and sedges growing on poorly drained substrate. Includes *Broussaisia arguta*, *Clermontia* spp., *Pelea clusiaefolia*, *Cibotium* spp., *Carex alligata*, *Eleocharis obtusa*, *Juncus effusus*. Mosses and ferns are abundant.
- (C) Dominated by tree fern (*Cibotium* spp., primarily *C. glaucum*).
- (Dic) Dominated by matted 'uluhe fern (*Dicranopteris linearis*).
- (ds) Complex of native shrubs growing in dry alpine or subalpine habitats. Includes *Styphelia tameiameia*, *Vaccinium* spp., *Geranium* sp., *Dubautia ciliolata*, *D. scabra*, and *Coprosma erndioides*.
- (mg) Mixed grass complex. Includes primarily *Deschampsia australis*, *Holcus lanatus*, and *Poa pratensis*.
- (ms) Complex of native shrubs and ferns growing in upper elevation forests. Includes *Dryopteris paleacea*, *Coprosma* sp., *Vaccinium calycinum*, *Rubus hawaiiensis*, and *Cibotium* spp.
- (x) Disturbed understory, dominated by introduced species, particularly *Psidium cattleianum*.

Other Information

- d Canopy trees with defoliated crowns; many standing dead trees.
- g Disturbed ground cover which has been extensively grazed by cattle.

¹Where two tree species were found to be codominant, the symbols for both are listed, separated by a comma.

JUN 12 '79

U.S. DEPT. OF AGRICULTURE
NAT'L AGRIC. LIBRARY
BETHESDA, MD 20815